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CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT [redacted]
CD NO.

COUNTRY	USSR
SUBJECT	Economic; Technological - Machine tools, metal saving
HOW PUBLISHED	Daily newspapers, monthly periodical
WHERE PUBLISHED	Moscow
DATE PUBLISHED	30 Aug-4 Dec 1953
LANGUAGE	Russian
DATE OF INFORMATION	1953
DATE DIST.	14 May 1954
NO. OF PAGES	3
SUPPLEMENT TO REPORT NO.	

THIS IS UNEVALUATED INFORMATION

SOURCE As indicated

NEW TECHNIQUES AND SUBSTITUTES SAVE EXPENSIVE METAL IN USSR

PROGRESS AT FREZER PLANT -- Moscow, Pravda, 4 Dec 53

In 3 years of the Fifth Five-Year Plan, the Moscow Frezer Plant imeni M. I. Kalinin has increased its production of cutting tools approximately 1.5 times in existing production area.

Plant engineers have set up the production of drills by the rolling method, which is 15 times as fast as milling. Now, 25 percent of expensive steel which formerly went into chips goes into the drill.

In 1953, the plant designed and perfected more than 20 new types of tools, including the KB head for internal pipe threading. This valuable attachment has made it possible to produce threads eight times as fast as before.

DESIGN NEW CONTROL PANEL -- Moscow, Moskovskaya Pravda, 1 Dec 53

Recently, Vyrodov and Kosovskiy, engineers at the Moscow Attachments Plant, developed an original design of a control panel for a pneumatic clamping device. An experimental model of the panel has been manufactured and tested.

Unlike panels now being produced, the new one is compact, is convenient to use, and requires less labor consumption in its manufacture. A number of parts for it have been converted from expensive nonferrous metals to cast iron, and scarce steel tubes have been replaced with a rubber hose.

According to preliminary estimates, this change will save the plant 150,000 rubles per year.

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BRONZE IN FRICTION UNITS REPLACED WITH ANTIFRICTION CAST IRON -- Moscow, Stanki i Instrument, Nov 53

All antifriction cast iron can be divided into three basic types: iron with plastic graphite, iron with temper graphite, and iron with spheroidal graphite.

Antifriction pearlitic and pearlitic-ferritic malleable irons with temper graphite cast by the centrifugal method (e.g., bushings) and in chill molds (e.g., blocks) have been developed by the Institute of Agricultural Machine Building in cooperation with the Rostov-on-Don Rostsel'mash Agricultural Machine Building Plant imeni Stalin. These cast irons, operating under impact-load conditions, are exceptional in that they contain no nonferrous metal and in that the range of their application is significant, embracing an overwhelming part of friction units in metal-cutting machine tools, press and forging equipment, and tractors.

A number of machine tools equipped with bushings made of antifriction malleable iron instead of bronze have operated for a considerable length of time at the plant and promise to continue to operate satisfactorily. For example, a 30-ton eccentric press with the bushing of the eccentric shaft made of normalized pearlitic-ferritic malleable iron has operated for 3,200 hours; 13 bushings made of bronze were replaced with bushings made of antifriction malleable iron in an eight-spindle nut-threading automatic and have already operated 4,200 hours. Lathes; drilling, spline-milling, bolt-threading, thread-rolling, and molding machines; rumblers; pumps; and other equipment have also operated satisfactorily.

Irons with spheroidal graphite treated with magnesium have greater strength than malleable iron, in spite of the increased carbon content. The irons retain plasticity, which is a property of malleable iron.

Laboratory and practical testing of these irons showed that the high-strength magnesium irons, as substitutes for bronze, can be used in friction units under the same conditions as pearlitic and pearlitic-ferritic malleable irons with temper graphite.

A scientific and technical conference on antifriction iron, organized by VSNITO (All-Union Council of Scientific and Engineering-Technical Societies) and held in Moscow in July 1953, passed a resolution on the need for reviewing GOST 1585-42 and for incorporating in it the wider use of the new types of iron as antifriction materials.

A resolution was also passed on the need for considerably expanding the use of antifriction irons as substitutes in friction units of new mechanisms and machines being planned by institutes and design bureaus, as well as for repair of present equipment.

URGE USE OF PRESS AND FORGING EQUIPMENT TO SAVE METAL -- Moscow, Moskovskiy Komsomolets, 30 Aug 53

The majority of parts of machines now being produced are manufactured by forging or press forming. Such parts comprise from 60 to 80 percent of the weight of motor vehicles, tractors, airplanes, locomotives, and turbines. Agricultural machines, calculating machines, watches, and certain instruments are made up almost completely of sections and parts produced under pressure.

The most productive method of working metals by pressure is press forming. For example, one cold upsetting automatic for manufacturing rollers for radial thrust bearings replaces six bar-type automatics in a machine shop. The press forming of rings for radial thrust bearings on one forming press has released 15 lathes.

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The advantages of press forming can be seen by comparing the methods formerly used in manufacturing an automobile body to the methods now used in a press shop of a modern plant. Formerly, a highly skilled tinsmith took several days to make one fender. This was followed by many hours of fitting. Powerful forming presses now put out hundreds of parts in one hour. These parts not only have a perfect shape but also require no fitting because they are made to specified dimensions.

Presses and forging machines are producing parts of the most diverse shapes and sizes from giant 200-ton forgings for hydraulic-turbine rotors to small watch parts which can only be handled with tweezers.

Cold press forming also helps to save material. In machining operations, a large quantity of metal is transformed into chips. Cast parts are always heavier than those obtained by cold press forming from sheet. In the production of cast parts, there is waste in the form of flow gates and evaporation. In cold press forming, only an insignificant amount of thin sheet is wasted.

Soviet scientists and engineers are modernizing press and forging machines, are decreasing the amount of waste, and are improving the quality of products. For example, in hot press forming, a part of the metal usually flows out from the cavity into the space between the top and bottom dies, forming a seam. The seam sometimes comprises one third of the weight of the part. A method developed recently and known as the seamless method of press forming eliminates the seam and saves a great deal of metal.

Moscow, Stanki i Instrument, Nov 53

In machining parts made of rolled stock on metal-cutting equipment at machine building enterprises, the waste in chips is, on an average, 40-50 percent of the total quantity of met- required. In machining one million tons of steel on metal-cutting machine tools, 400,000 - 500,000 tons of steel are wasted. In processing one million tons of steel on pressing and forging equipment, about half as much metal is wasted, a saving of 200,000 - 250,000 tons of steel.

According to data of the TsBKM (Central Bureau of Presses and Forging Machines), an average of 200 machine-tool hours are lost for each ton of chips. By converting the processing of one million tons of steel from metal-cutting equipment to pressing and forging equipment, about 17,000 units of metal-cutting equipment and 34,000 workers and machine-tool operators can be released in one year for other needs as a result of saving steel alone.

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